REMARKS

Favorable reconsideration, reexamination, and allowance of the present patent application are respectfully requested in view of the foregoing amendments and the following remarks. Support for the foregoing amendments can be found in the original claims and the specification. No new matter is added.

Rejection under 35 U.S.C. § 112, second paragraph

In the Office Action, beginning at page 3, Claims 1, 3 and 9 were rejected under 35 U.S.C. § 112, second paragraph, as reciting subject matters that allegedly are indefinite. Applicant respectfully requests reconsideration of this rejection.

Claims 3 and 9 have been canceled. Claim 1 has been amended to incorporate many of the limitations of the dependent claims. Specifically for the rejection recited in section a) on page 3, claim 1 has been amended to state that the ***expression*** of an arginine repressor is reduced or eliminated as compared to a non-modified bacterium. It is asserted that these amendments adequately address the concerns of the rejection.

In section b) of this rejection, claim 3 was rejected. Claim 3 has been cancelled and the rejected language has not been added to claim 1.

For at least the foregoing reasons, Applicant respectfully submits that Claim 1 fully complies with 35 U.S.C. § 112, second paragraph, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 112.

Rejection under 35 U.S.C. § 112, first paragraph

In the Office Action, beginning at page 4, Claims 1, 3 and 9 were rejected under 35 U.S.C. § 112, first paragraph, as reciting subject matters that allegedly fail to comply with the written description and enablement requirements. Applicant respectfully requests reconsideration of this rejection.

Claims 3 and 9 have been cancelled. The specific mutation in the adenylation

site, the sequence of the glutamate synthetase, and the sequence of the arginine repressor are all specified in claim 1. Both the arginine repressor and the glutamate synthetase protein are recited as being at least 90% homologous with the exact known protein sequences for these proteins as recited by SEQ ID NO.. Sufficient information was known about the structures of these two proteins to adequately describe and enable, in combination with the instant disclosure and working examples, the claimed invention. Furthermore, a person of ordinary skill in the art would be able based upon the specification and the knowledge in the art about these proteins to determine variants within 10% sequence variation from the stated SEQ ID Nos. (the wild-type sequences) that would have the stated funtions. Applicants assert that the scope of the claims must be analyzed in light of the specification, the level of skill in the art, which is very high in this art, and the knowledge in the art. It is asserted that one of ordinary skill could practice the invention without undue experimentation based on the description in the specification combined with the knowledge in the art regarding the arginine repressor and glutamate synthetase, a high knowledge of general manipulative procedures for bacteria, and the high level of skill in this art.

For at least the foregoing reasons, Applicant respectfully submits that Claim 1 fully comply with 35 U.S.C. § 112, first paragraph, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 112.

Rejection under 35 U.S.C. § 103(a)

In the Office Action, beginning at page 8, Claims 1, 3 and 9 were rejected under 35 U.S.C. § 103(a), as reciting subject matters that allegedly are obvious, and therefore allegedly unpatentable, over the disclosure of Suga et al. in view of Jakoby et al. and Nakayama et al. Applicant respectfully requests reconsideration of this rejection.

The Examiner cites for support of the rejection the statement in Jakoby et al., "the central enzyme for the assimilation of ammonia under limiting conditions is glutamine

synthase" (see page 305, section 3.1). However, Jakoby et al. do not refer to a scientific publication nor present data that support this assertion. Furthermore, Jakoby et al. only show the data (see Fig. 1) which speculates about the relationship between glutamine synthase and ammonia concentration. Fig. 1 shows GS activity of strains carrying the wild-type GS and the mutant GS (Y405F) in the presence or absence of ammonium ion, and this data only indicates that the activity of the wild-type GS decreases in the presence of a high concentration (20mM) of ammonium ion while the activity of the mutant GS does not. However, in amino acid fermentation, the ammonium concentration is generally very low, and when the ammonium ion is consumed by amino acid formation, a corresponding amount of ammonium ion can be supplemented. That is, in typical culture mediums used in amino acid fermentation, ammonium ion concentration is not so high as that shown in Fig. 1, and therefore, GS activity does not decrease. Therefore, a skilled person in the field of amino acid fermentation would never consider from the description of Jakoby et al. that it is necessary to enhance GS activity to produce amino acids. For this reason, among others, the present invention is not obvious over Jakoby et al., either alone or in combination with the other references.

To further demonstrate the non-obviousness of the instant invention over the cited references, data is submitted in the form of a declaration under 35 C.F.R. §1.132. This data shows the GS activity and GDH activity in L-glutamine-producing *Brevibacterium flavum* and a sulfaguanidine-resistant derivative thereof. L-glutamine was produced in the amount of 9.9 g/L in the *Brevibacterium flavum* parent strain, and 47 g/L in the sulfaguanidine-resistant strain. This data shows that GS activity is very low in L-glutamine producing strinas, and enhancing GS activity is not a critical factor in amino acid fermentation.

Finally, Applicants assert that a person skilled in the art would not expect that the combination of enhancing the GS activity and disrupting the arginine repressor would result in the production of L-lysine and L-arginine. Therefore, the present invention is

not obvious over Suga et al., even combined with the disclosures of Jakoby et al. and Nakayama et al..

For at least the foregoing reasons, Applicant respectfully submits that the subject matters of Claim 1 each taken as a whole, would not have been obvious to one of ordinary skill in the art at the time of Applicant's invention, are therefore not unpatentable under 35 U.S.C. § 103(a), and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 103(a).

Conclusion

For at least the foregoing reasons, Applicant respectfully submits that the present patent application is in condition for allowance. An early indication of the allowability of the present patent application is therefore respectfully solicited.

If Examiner Steadman believes that a telephone conference with the undersigned would expedite passage of the present patent application to issue, he is invited to call on the number below.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and the Commissioner is hereby authorized to charge fees necessitated by this paper, and to credit all refunds and overpayments, to our Deposit Account 50-2821.

Respectfully submitted,

By: _____

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